

CLAIMS

We Claim

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a. >
1. A method for withdrawing a fluid sample from a patient, comprising the steps of:
 - a.. providing a sampling device having a housing and a needle having a sharpened tip for piercing the skin of the patient.
 - b. collecting fluid from the patient in the housing;
 - c. retracting the needle so that the sharpened tip of the needle is shielded to prevent inadvertent contact with the sharpened tip; and
 - d. expelling the fluid from the housing after the needle is retracted.
 2. The method of claim 1 wherein the device comprises a plunger displaceable within the housing and the step of expelling fluid comprises the step of displacing the plunger within the housing.
 3. The method of claim 1 comprising the step of sealing the fluid within the housing.
 4. The method of claim 1 wherein the step of retracting comprises the step of displacing the needle rearwardly into the housing while the collected fluid is in the housing.
 5. The method of claim 1 comprising the step of analyzing the collected fluid to determine a characteristic of the collected fluid.
 6. The method of claim 5 comprising the step of analyzing the pH level of the collected fluid.

levels of the collected fluid.

8. A medical device, comprising:

a hollow housing having a fluid chamber for receiving fluid and an orifice adjacent the fluid chamber;

a needle projecting through the orifice in fluid communication with the fluid chamber, wherein the needle has a sharpened tip operable between a projecting position in which the sharpened tip projects forwardly from the housing and a retracted position in which the sharpened tip is shielded to prevent inadvertent contact with the sharpened tip;

a plunger axially displaceable within the fluid chamber having a cavity for receiving at least a portion of the needle after the needle is retracted;

a first seal providing a fluid-tight seal between the needle and the orifice a fourth retraction and sealing the orifice to prevent fluid leakage from the fluid chamber after retraction; and

a second seal providing a fluid-tight seal to prevent fluid in the fluid chamber from leaking into the plunger cavity during retraction;

wherein the device is operable to collect fluid from a patient into the fluid chamber, and the needle is displaceable into the retracted position while the fluid chamber contains collected fluid, and the first and second seals prevent collected fluid from leaking out of the fluid chamber during retraction of the needle.

9. The device of claim 8 comprising a biasing element biasing the needle rearwardly toward the retracted position.

10. The device of claim 9 wherein the biasing element is disposed

within the plunger.

- 10 11. The device of claim 8 comprising a needle retainer releasably retaining the needle in the projecting position.
- 11 12. The device of claim 8 comprising a vent configured to allow gas to escape from the fluid chamber while preventing liquid from leaking from the fluid chamber.
- 12 13. The device of claim 8 wherein the fluid chamber is located between the forward end of the plunger and the forward end of the housing.
- 13 14. The device of claim 8 wherein the first seal is removably attached to the housing to allow collected fluid in the fluid chamber to be expelled from the device.